Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

DRAFT
Conditional Major / Synthetic Minor, Construction / Operating
Permit: F-09-007
The United States Playing Card Company
Erlanger, KY 41018
March 23, 2009
Diana Robertson, Reviewer

SOURCE ID:	21-015-00166
AGENCY INTEREST:	47208
ACTIVITY:	APE20090001

SOURCE DESCRIPTION:

On January 13, 2009, an application was received from The United States Playing Card Company for the construction/operation of a playing card production facility in Erlanger, KY. The facility will be located in Boone County, which is designated as a non-attainment area for ozone, pursuant to 401 KAR 51:010.

The facility consists of several lithographic printing, coating, and laminating processes. Also included are die cutting operations, a finishing area, a trim removal system, and parts washers:

(01) Press #30 produces sheets of playing cards. The lithographic printing operation is comprised of six perfecting printing units, a perfecting coater, a natural gas-fired dryer/afterburner, which serves as a dryer and as the control for volatile organic compounds (VOC's), and miscellaneous associated operations. The emission sources include the printing, coating, and drying operations.

(02) Press #26 also produces sheets of playing cards. The sheet-fed offset lithographic printing operation is comprised of 6 printing units, a coating operation, an electric infrared dryer, a spray powder process, and miscellaneous associated operations. The printing and coating are emission sources, under no VOC control. The spray powder process, an additional emission source, includes the powder spray operation, an exhaust system, followed by an air filtration system and an exhaust stack.

(03) The laminating line produces rolls of laminated playing card stock utilizing an aqueous adhesive and a natural gas-fired dryer.

(04) The coating line, which produces sheets of laminated playing cards, is comprised of a UV coating operation and an electric UV dryer, neither with VOC controls. The isopropyl alcohol clean-up solution is the primary emission source for the process.

(05) The trim removal system is used to collect paper trim from the die cutting operations and has a dust collector system and a return air filter as controls for PM. Each of these

systems will have a pressure transmitter connected to the trim removal system control panel. The monitoring panels will continuously display the pressure drop for the filters and when either pressure drop reaches a pre-set point a warning is issued on each panel. Exhaust from the trim removal system is returned into the building.

(06) Three cold cleaner parts washers are utilized throughout the facility.

In general, inks, fountain solutions, solvents, coating solutions, and clean-up solutions are the primary emission sources of VOC's as well as low levels of hazardous air pollutants. The spray powder process, die cutting operations, and gas-fired dryers are the main sources of PM emissions.

COMMENTS:

Emission Point 01: Press #30

- The Ecotherm dryer consists of a dryer with an afterburner/incinerator. The afterburner is an integral part of the dryer and serves as the control device. Per the Ecotherm 173-1020 manual (Section 1: Main Dryer Functions), "the dryer has been equipped with two burner units, which heat the air needed for the drying process and burn the solvents contained in the circulation air. A separate afterburner is therefore not required for this dryer, as it has been incorporated into the dryer itself."
- The control efficiency[1] is assumed to be 90% since the unit has not yet been installed. The unit has two burners with a total gas usage of 5.6 mmBTU/hr.
- A performance test shall be conducted to determine the VOC destruction efficiency of the dryer afterburner.
- Per the Ecotherm 173-1020 manual (Section 5: Stack Emissions Performance) supplied by the source, "the dryer is not able to function when the incinerators are switched off."
- For the ink[2], it is assumed that 80% of the VOCs contained in the ink are captured and conveyed to the control device. The remaining 20% is retained in the substrate.
- The ink is assumed to be composed of 12.8% VOC, for use in potential emission calculations, based on information from the MSDS and the source.
- For the fountain solutions and coatings[2], it is assumed that 70% of the VOC content is captured and conveyed to the control device. The remaining portion is emitted.
- For the wash solutions[2], it is assumed that 40% of the VOC content is captured and conveyed to the control device. The remaining portion is emitted.
- The organic HAP content for aromatic naphtha, a component of the blanket roller wash, was obtained from 40 CFR 63 Subpart RRRR Table 3, and the organic HAP content for aliphatic naphtha, also a component of the blanket roller wash, was obtained from 40 CFR 63 Subpart RRRR Table 4.

Emission Point 02: Press #26

- For the ink[2], it is assumed that 20% of the VOC's contained in the ink are retained in the substrate, and the remainder is emitted.
- Based on information provided by the source for the spray powder process, the following information was used in the potential emission calculations:
    - 75% of the sprayed powder is captured and held on the substrate.
    - Of the remaining 25%, 1.25% is emitted into the building, and the remaining 23.75%

is conveyed to the exhaust system. In the exhaust system, the powder-laden air is combined with hot air from the dryer, which is then directed into an air filtration system.

- The air filtration system is assumed to have an efficiency of 99.9%, with 0.1% being emitted to the atmosphere through an exhaust stack.

Emission Point 03: Laminating Line

- The aqueous adhesive used on this coating line does not contain VOCs.

Emission Point 04: Coating Line

- The Nicoat Coating used for this line is a UV coating with no VOC content.

Emission Point 05: Die Cutting Equipment and Finishing Area

- A trim removal system provides the PM emission controls for the die cutting equipment and the finishing area.
- A control efficiency of 99% was used for the combination of the dust collector system and the air filter system, elements of the trim removal system.
- A building enclosure control efficiency of 70% was used for the potential emission calculations.
- An emission factor of 39.96 lb PM/ton of paper was used. This value was determined based on information from two sources: 1) the Statement of Basis for the Kentucky Division for Air Quality conditional major permit, F-05-026 dated 7/11/05, which used an emission factor of 27.7 lb PM/ton of raw material for a foam insulation board trimming process, and 2) the Technical Review Document for Operating Permit 96OPWE178 for R.R. Donnelley dated 12/2/98, from the Colorado Division for Air Quality, which used an emission factor of 39.96 lb PM/ton of paper for a lithographic printing facility with a paper trimming process (this emission factor was derived from actual source testing for dust generation). The 39.96 lb PM/ton of paper was used for this permit because of the similarity to the Colorado process and because it portrayed a worst case scenario.

Emission Point 06: Parts Washers (3)

- It is assumed that the three cold cleaner parts washers are being utilized throughout the facility, and, as a result, they will be treated as separate activities. For simplicity, the three are combined into one entry in the permit, and they are included in the insignificant activities section due to potential PM emissions of less than 5 tpy.

All Emission Points and Natural Gas-Fired Dryers

- Operating hours: 6600 hours/year (8760 hours/year less time required for make-ready/set-up time).
- The heating value of natural gas was assumed to be 1 mmBTU/1000scf.
- Criteria pollutant emission factors for the natural gas-fired dryers were obtained from AP-42, 5th Edition Volume I, Chapter 1, Section 1.4 – Natural Gas Combustion.

Applicable Regulations

401 KAR 59:010, *New Process Operations*, applicable to each affected facility or source, associated with a process operation, which is not subject to another emission standard with respect to particulates, commenced on or after July 2, 1975.

401 KAR 59:210, *New Fabric, Vinyl and Paper Surface Coating Operations*, applicable to each affected facility commenced on or after June 29, 1979 and located in a county or portion of a county designated as nonattainment for ozone in 401 KAR 51:010. This rule applies to the coating process (MP04) of Emission Point 01 and the coating process (MP05) of Emission Point 02; however, pursuant to 401 KAR 59:210 Section 6(1), they both shall be exempt from Section 3 of this administrative regulation because the VOC content of the coating is less than 2.9 lb/gal, excluding water or exempt solvent or both, delivered to the applicators associated with the coating line.

401 KAR 63:020, *Potentially Hazardous Matter or Toxic Substances*

The Division for Air Quality (Division) has performed air dispersion model screening of potentially hazardous substances that may be emitted by the facility based upon the process rates, material formulations, stack heights and other pertinent information provided by the applicant. Based upon this information, the Division has determined that the conditions outlined in this permit will assure compliance with the requirements of 401 KAR 63:020.

The following is a summary of the potentially hazardous substances upon which screening was performed, the modeled worst case impacts, and the level of concern (LOC) that would have triggered additional review and/or more detailed modeling. Since only worst case screening modeling was performed, these results do not, nor are they intended to, portray actual risk.

Emission Point	CAS #	Pollutant	Modeled Impact (µg/m3)	Level of concern (µg/m3) (non-carcinogenic risk)	Level of concern (µg/m3) (carcinogenic risk)
01	1330-20-7	Xylene	0.02	10.00	N/A
01	98-82-8	Cumene	0.02	40.00	N/A
01	108-88-3	Toluene	0.02	500.00	N/A
01	100-41-4	Ethylbenzene	0.02	100.00	N/A
02	91-20-3	Naphthalene	0.02	3.00	0.03

Precluded Regulations

401 KAR 51:052, *Review of New Sources In or Impacting Upon Nonattainment Areas*, does not apply due to the imposed annual source-wide VOC emissions limit of 25 tons per year for each twelve (12) consecutive months.

401 KAR 52:020, *Title V Permits*, does not apply due to the imposed annual source-wide VOC emissions limit of 25 tons per year for each twelve (12) consecutive months.

401 KAR 59:210, *New Fabric, Vinyl and Paper Surface Coating Operations*, does not apply to Emission Points 03 and 04. These operations are not considered to be affected facilities because the coatings used in the coating lines do not contain VOCs (401 KAR 59:210 Section 1:4). If VOC containing materials are to be used, this administrative regulation will be applicable and the permit will need to be revised accordingly.

EMISSION AND OPERATING CAPS DESCRIPTION:

The source-wide VOC potential emissions, calculated from information in the application submitted by the source, are approximately 120 tons per year. An imposed VOC emission limitation of 25 tons per year will allow the source to operate as a conditional major source and to preclude 401 KAR 52:020 by remaining below the threshold of 100 tons per year. Because the source is located in a non-attainment area for ozone, the limit will also allow the source to operate as a synthetic minor source and to preclude 401 KAR 51:052 by remaining below that threshold of 100 tons per year.

The source-wide volatile organic compound (VOC) emissions shall not exceed 25 tons per year. The annual limitation shall not be exceeded during any consecutive 12-month period for the entire source.

Pursuant to *Cabinet Provisions and Procedures for Issuing Federally-Enforceable Permits for Non-Major Sources*, Section 2(II)(11)[3], a new or reconstructing source that is also a synthetic minor shall not be allowed to construct or operate until the final permit is issued.

OPERATIONAL FLEXIBILITY:

None

PERIODIC MONITORING:

The permittee shall continuously monitor the combustion temperature of the Ecotherm dryer/afterburner during printing and coating operations, and the automatic shutdown system shall be inspected at least once every month to verify that it will detect diversions of flow and will shut down operations in the event of such diversion.

Pressure drop for the trim collection system, in accordance with the manufacturer's specifications, shall be monitored daily in order to insure proper operation of the trim removal system at all times.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997,

the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.

FOOTNOTES

[1] Reference: Control Techniques Guidelines for Offset Lithographic Printing and Letterpress Printing (EPA-453/R-06-002, September 2006), Section VI. Recommended Control Options.

[2] Reference: Control Techniques Guidelines for Offset Lithographic Printing and Letterpress Printing (EPA-453/R-06-002, September 2006), Section VIII. Factors to Consider in Determining VOC Emissions from Offset Lithographic Printing and Letterpress Printing.

[3] *Cabinet Provisions and Procedures for Issuing Federally-Enforceable Permits for Non-Major Sources*, is incorporated by reference pursuant to 401 KAR 52:030, Section 26(1).